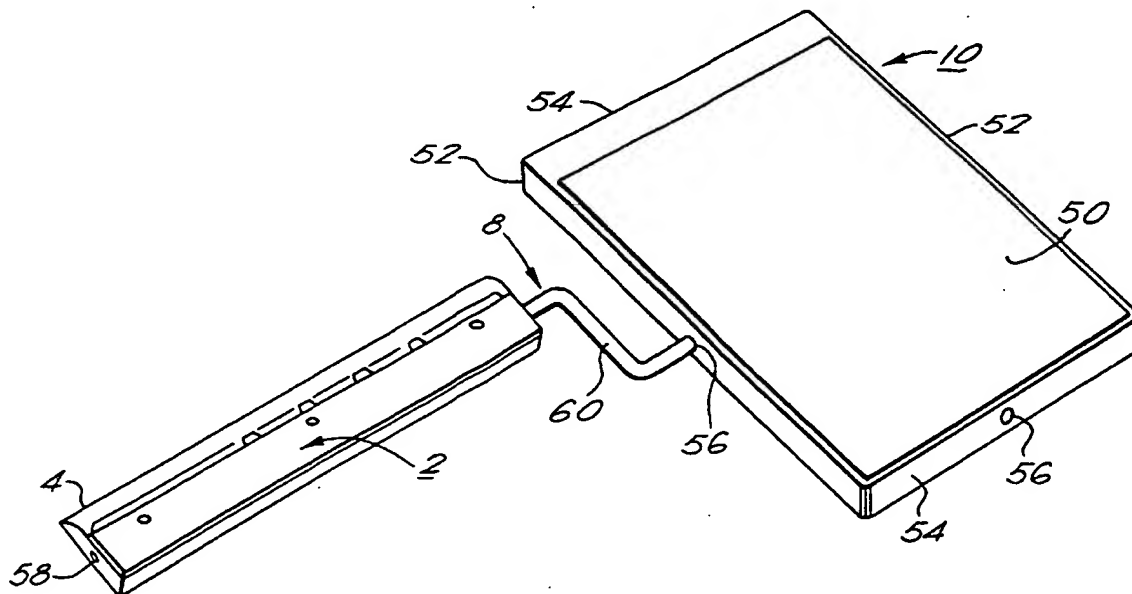




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: GUIDE APPARATUS FOR FACILITATING CALCULATIONS



## (57) Abstract

Guide apparatus includes an elongate ruler (2) with a straight edge (4) connected by way of hinge means (8) to a calculator apparatus (50). The guide apparatus enables the straight edge (4) to be moved horizontally down a page of vertical columns of figures simultaneously with the calculator apparatus (50). A calculator supported by or incorporated in the calculator apparatus (50) is positioned so that its display and the straight edge are within a single visual field of a user to facilitate the performance of arithmetic operations. The calculator apparatus (50) may support a calculator, or may constitute the calculator. In an embodiment, the calculator housing (50) and the ruler (2) have bores (56, 58) for the receipt of ends of a cranked rod (60) forming the hinge means (8).

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-1-

GUIDE APPARATUS FOR FACILITATING CALCULATIONS

The present invention relates to guide apparatus for facilitating calculations.

5 Accountants, bankers, and analysts, for example, frequently have a need to make arithmetic operations on rows and columns of figures. Although calculators are now available to assist with the arithmetical operations, it is often difficult for the operator to accurately follow the  
10 rows or columns on which the operations are being performed because there is a visual interruption between the calculator and the data. Commonly the operator will move a ruler over the page to keep track of the figures which have already been included in the calculation. Although this  
15 practice does assist, it is still not ideal.

According to a first aspect of said present invention there is provided a guide apparatus for facilitating calculations, said guide apparatus comprising a rule having a straight edge, and a calculator apparatus connected to  
20 said rule, said calculator apparatus being connected to a part of said rule spaced from the straight edge thereof.

Guide apparatus of an embodiment of the invention enables the rule and the calculator apparatus to be moved simultaneously and this can considerably shorten the  
25 operator's working time.

The calculator apparatus may be connected to said rule along an edge opposed to said straight edge or along an edge generally transverse to said straight edge.

Preferably, the connection between the calculator  
30 apparatus and the rule is made by way of hinge means.

In an embodiment, said hinge means connecting the calculator apparatus and the rule comprises a double hinge.

For example, the double hinge has two substantially parallel hinge axes which extend in different planes. This  
35 enables the rule and the calculator apparatus also to be arranged in different planes. One of the rule and the

-2-

calculator apparatus may, for example, be supported on a paper or book, whilst the other of the calculator apparatus and the rule is supported on a work surface. The provision of a double hinge is particularly preferred where the  
5 calculator apparatus is connected to said transverse edge of said rule.

Said hinge means may be arranged to enable the rule to be selectively positioned in a first, use, position extending to one side of said calculator apparatus and in a  
10 second, folded, position extending over at least part of said calculator apparatus. For example, the hinge axes of said double hinge may enable folding of the rule to said second position.

Additionally and/or alternatively, a pivot axis may be  
15 provided to enable the rule to be selectively positioned in a first, use, position extending away from said calculator apparatus and in a second, non use, position in which the rule extends substantially along one edge of said calculator apparatus. In this embodiment, a recess or slot  
20 for receiving at least part of said rule when in the second position may be provided in said calculator apparatus.

In a preferred embodiment, said hinge means comprises a cranked rod having one end engaged with said rule and its opposed end engaged with said calculator apparatus. For  
25 example, said cranked rod may be substantially Z-shaped.

The cranked rod is preferably rotatable and/or pivotable about a longitudinal axis thereof whereby the rule and the calculator apparatus can be arranged in different planes.

30 Preferably, said one end of said cranked rod is connected to said transverse edge of said rule.

Said cranked rod may be arranged to enable the rule to be selectively positioned in a first use position extending to one side of said calculator apparatus and near to a top  
35 edge of the calculator apparatus. Alternatively, the rule may be selectively positioned in a second use position

-3-

extending to one side of said calculator apparatus and near to a lower edge of the calculator apparatus.

In a preferred embodiment, said cranked rod releasably connects said rule and said calculator apparatus. For example, said one end thereof is a push fit into a bore provided in said rule, and the opposed end is a push fit into a corresponding bore provided in said calculator apparatus. The cranked rod may be selectively disengaged from said calculator apparatus and/or said rule as required.

In an embodiment, recesses are provided in said calculator apparatus for receiving said cranked rod and said rule when not connected to said calculator apparatus.

In one preferred embodiment, said calculator apparatus comprises a calculator having a housing. The opposed end of said cranked rod is engaged with said calculator housing. If required, the calculator may be an existing calculator which has been modified by the provision of at least one bore in its housing for releasably receiving said opposed end of said cranked rod.

In an embodiment, said rule is preferably a ruler. This ruler may be made of any appropriate material, for example, of wood, plastics material or metal and preferably has a substantially planar underneath support surface and at least one straight edge extending longitudinally thereof.

In a preferred embodiment, said ruler is made of a transparent material and/or has a window therein.

Part of said ruler may comprise, or may include, a magnifying lens. For example, the transparent material of the ruler may be shaped to form a magnifying lens.

Preferably, the ruler is marked along its length with a scale. The scale and the markings can be chosen as required.

At least one moveable marker may be supported on said ruler and is arranged to be moveable longitudinally

-4-

thereof. In a particularly preferred embodiment, two moveable markers are provided.

Said calculator apparatus may comprise support apparatus on which a writing pad, calculator, or other equipment may be supported. In one embodiment, said support apparatus is a substantially planar support member having at least one bore therein for receiving said opposed end of said cranked rod.

Preferably, said support apparatus is substantially rectangular in shape having two opposed long sides joined by two opposed short sides. In this case, a respective bore for receiving said opposed end of said cranked rod is provided in at least one of said long sides and in at least one of said short sides. This enables the orientation of the support apparatus relative to said rule to be chosen as required.

In an embodiment, a respective bore is provided in each of said sides of the support to selectively enable left-handed and right-handed use in either orientation of the support.

Preferably, said support apparatus has a substantially planar support surface on which said calculator or other equipment is received.

The equipment on said support apparatus may be supported to be immobile relative to said support apparatus. In a preferred embodiment, retention means for retaining equipment on said support apparatus is provided. The provision of retention means enables an operator to use both hands to operate a calculator, for example, and guide the calculator apparatus, it being unnecessary for the operator to support the calculator.

Space may be provided on the support apparatus for logos or trademarks, for example, or for other information.

Said retention means may comprise one or more clips fastened to said support apparatus, one or more grooves or recesses provided in such support apparatus, one or more

-5-

surface.

In one embodiment, particularly where the equipment to be supported is a calculator, said support apparatus may form part of a housing of the calculator.

5 In a preferred embodiment, said support apparatus has a substantially planar support surface on which a calculator or other equipment may be supported. The support surface may be provided with a recess to receive the calculator, for example.

10 In a particularly preferred embodiment, the size of the support surface is adjustable to enable differently sized calculators to be selectively supported thereon. Additionally and/or alternatively, the size of the retention means may be adjustable.

15 In a preferred embodiment, said support apparatus comprises a substantially flat, hollow support body in which a corresponding substantially flat extension body is telescopically received. Said retention means comprise cooperating projections carried on both said support body  
20 and on said extension body whereby relative positioning of the support body and the extension body selects the distance between corresponding projections.

Preferably, a base surface of said support apparatus carries wheels, rollers or bearings to facilitate movement  
25 of the guide apparatus over a work surface.

In one preferred embodiment, said calculator apparatus comprises a calculator having a housing. The opposed end of said cranked rod is engaged with said calculator housing.

30 In this respect, the calculator housing is preferably provided with at least one bore for releasably receiving said opposed end of said cranked rod.

In a preferred embodiment, existing calculators may be simply modified by the provision of at least one bore  
35 therein in order to facilitate the connection of a rule thereto in accordance with the invention.

According to a further aspect of the present invention

there is provided rule apparatus for releasable connection to a calculator, said rule apparatus comprising a ruler having a straight edge, the ruler being provided with a bore in an edge thereof which extends generally transverse to said straight edge, and a cranked rod having spaced ends, one of said ends of the cranked rod being releasably receivable within said bore in said transverse edge.

Said ruler and/or said cranked rod may be as defined above.

10        Embodiments of the present invention will hereinafter be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 shows a perspective view of guide apparatus of a first embodiment of the present invention,

15        Figure 2 shows a plan view from above of the apparatus of Figure 1,

Figure 3 shows an end elevation of the apparatus of Figures 1 and 2 in its use position,

20        Figure 4 shows an end elevation of the apparatus of Figures 1 and 2 in its folded position,

Figure 5 shows a perspective view of guide apparatus of a further embodiment of the present invention,

Figure 6 shows a perspective view of the guide apparatus of Figure 5 in an alternative use position, and

25        Figure 7 shows a view of the underside of support apparatus of the guide apparatus of Figures 5 and 6.

The embodiments of the guide apparatus illustrated are each arranged to enable a straight edge forming a guide to be moved horizontally down a page of vertical columns of figures, that movement simultaneously moving a calculator apparatus relative to the page. A calculator supported on, or forming part of, the calculator apparatus may be positioned so that its display is substantially horizontally arranged relative to the straight edge such that the straight edge and the display are within a single visual field for the user. This facilitates the performance, on figures given on the page, of arithmetic

30  
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-7-

operations utilising the calculator.

The embodiment of the guide apparatus shown in Figures 1 to 4 of the drawings comprises an elongate ruler 2 having a straight edge 4 extending longitudinally thereof.

5 Preferably the ruler 2 is made of a plastics material which is either transparent or clear. In the embodiment illustrated, the ruler 2 has a substantially planar base surface and a curved top surface whereby the body of the ruler forms a magnifying lens. A scale indicated at 6  
10 having appropriate indicia is provided to extend longitudinally of the ruler 2.

At one edge thereof, which extends substantially transversely to its longitudinal straight edge 4, the ruler 2 is connected by way of hinge means 8 to a calculator  
15 apparatus comprising a support or support apparatus 10 on which a calculator (not shown) may be retained. In the embodiment of Figures 1 to 4, the support 10 has a first hollow, substantially flat, body part 12 and a second, substantially flat, extension part 14 which is  
20 telescopically received within the body part 12. The extension part 14 defines one outer transverse edge 16 of the support 10 and it will be appreciated that the relative positions of the body part 12 and of the extension part 14 can be varied to adjust the spacing between the one outer  
25 transverse edge 16 of the support 10 and the opposed outer transverse edge 18 thereof.

Each of the parts 12 and 14 of the support 10 carries a respective pair of upstanding projections 20 arranged to form retention means for the calculator to be supported on  
30 the upper surface of the support 10. In the embodiment illustrated, the body part 12 carries two spaced, transversely aligned projections 20 which face two similarly spaced and transversely aligned projections 20 on the extension part 14. It will be appreciated that  
35 adjustment of the extension part 14 relative to the body part 12 also varies the spacing between the two pairs of projections 20. As can be seen in Figures 3 and 4, a

-8-

planar base surface of the body part 12 of the support 10 is provided with wheels 22 to facilitate friction free movement of the support 10 over a work surface.

5 The hinge means 8 is arranged to enable planar base surfaces of the ruler 2 and of the support 10 to extend in offset planes and is also arranged to enable the ruler 2 to be folded relative to the support 10 when the guide apparatus is not in use. As is clearly visible in Figure 2, the hinge means 8 defines a first hinge axis 24 which is  
10 arranged to extend substantially transversely and parallel to the outer transverse edges 16 and 18 of the support 10. The hinge means 8 also comprises a second hinge axis 26 which is spaced from, and extends substantially parallel to, said first hinge axis 24. As is apparent in Figure 3,  
15 the hinge means 8 may be arranged such that the hinge axes 24 and 26, whilst remaining parallel to one another, extend in different planes whereby the base surfaces of the ruler 2 and of the support 10 extend similarly in different planes. As is also clear from Figure 4, the hinge means 8  
20 enables the ruler 2 to be folded to extend over the support 10 when not in use.

When it is required to use the guide apparatus illustrated, the ruler 2 is unfolded from the folded position shown in Figure 4 to the use position shown in  
25 Figure 3 in which the ruler 2 extends from one side of the support 10. In the use position, the base surface of the support 10 is supported by way of the wheels 22 on a work surface. The hinge means 8 is adjusted so that the base surface of the ruler 2 is resting on an adjacent book or  
30 other document. In this respect, it will generally be appreciated that the surface of the document will be higher than that of the work surface so that the base of the ruler 2 will generally need to be higher than the base of the support 10 as indicated in Figure 3.

35 The length of the support 10 is adjusted by pulling the extension part 14 outwardly of the body 12 and a calculator or other equipment is positioned on the surface

-9-

of support 10 between the projections 20. The extension part 14 is then moved inwardly relative to the body part 12 until the calculator is effectively gripped between the projections 20. The guide apparatus is then ready for use.

5       The body part 12 and the extension part 14 of the support 10 are provided with cooperating means to define the limits of their relative movement. In the embodiment illustrated, and as shown particularly in Figure 1, the cooperating means comprise cooperating cut-outs and  
10       projections indicated at 30 and 32 provided on the upper support surfaces thereof to act as stops defining the limit of the inward movement of the extension part 14 relative to the body part 12. Appropriate stops may also be provided, for example, internally of the body part 12, to limit the  
15       outward movement.

      In use, the operator positions the calculator on the support 10 so that the visual display thereof is substantially aligned with the ruler 2, for example, with its straight edge 4 or with its magnifying lens. To add up  
20       a column of figures the operator then moves the guide apparatus, for example, by way of the ruler 2, down the page and operates the calculator to add up each of the figures uncovered by the straight edge 4. During this operation, as the figures to be input and the calculator  
25       display are substantially within the same visual field the efficiency of the operation is increased. In this respect, it will be appreciated that as the guide apparatus is moved over the page, the straight edge and the visual display of the calculator remain in exactly the same position relative  
30       to one another.

      A further embodiment of guide apparatus of the invention is illustrated in Figures 5 to 7, and in these figures features of the guide apparatus which are substantially the same as those of the apparatus of Figures  
35       1 to 4 have been accorded the same reference numerals.

      The embodiment of the guide apparatus shown in Figures 5 to 7 of the drawings similarly comprises an elongate

-10-

ruler 2 with a straight edge 4. As previously, a scale (not visible), having appropriate indicia, may be provided to extend longitudinally of the ruler 2.

In the embodiment of Figures 5 to 7, the calculator apparatus, to which the ruler 2 is connected by way of hinge means 8, comprises a substantially rectangular support 10 having a substantially planar, upper support surface 50. A calculator (not shown) may be arranged to sit on the support surface 50 and in this respect the surface 50 may be covered or configured to retain the calculator in position, and/or to restrain the calculator against movement relative to the surface 50. For example, the support surface 50 may be covered with a plush or ridged fabric arranged to restrain movement of the calculator relative to the surface 50. Additionally and/or alternatively, adhesive pads or other physical retention means may be provided and engaged with the calculator and the surface 50.

As can be seen from Figure 5, the support 10 has two opposed long sides 52 which are joined by two opposed short sides 54. A respective bore 56 is provided substantially centrally along the length of at least one of the long sides 52 and of at least one of the short sides 54. The provision of bores 56 in both long and short sides 52, 54 enables the orientation of the support 10 relative to the ruler 2 to be chosen as is required. This is illustrated by Figures 5 and 6, in that, in Figure 5 the support 10 is arranged with its maximum dimension substantially perpendicular to the longitudinal extent of the ruler 2. In Figure 6, the support 10 has been rotated through 90°. In this respect, the hinge means 8 is formed by a cranked rod 60 having two spaced ends which are not only spaced longitudinally along the length of the rod but are also offset with respect to one another. In the embodiment illustrated, the cranked rod 60 is substantially Z-shaped.

As can be seen, one end of the rod 60 is received within a bore 58 provided in a transverse edge of the ruler

-11-

2. The opposed end of the rod 60 is received in a selected one of the bores 56 in the support 10. In the embodiment illustrated in Figure 5 the rod is engaged in a bore 56 in one of the long sides 52 of the support 10, whereas in the arrangement illustrated in Figure 6 the end of the rod 60 is engaged within a bore 56 in one of the short sides 54. Preferably, the ends of the rod 60 are a push fit in the respective bores 56, 58 in the ruler 2 and in the support 10. The connection is such that each end of the rod 60 is rotatable within its respective bore but can be released from the bore when required.

It will be appreciated that the hinge means 8 shown in Figure 5 provided by the cranked rod 60 enables the planar base surfaces of the ruler 2 and of the support 10 to extend in offset planes. In this respect, it is necessary only to move the ruler 2 to the desired orientation relative to the support 10, rotation of the ends of the rod 60 relative to the bores in the support and/or ruler enabling the required movement. Furthermore, the ruler 2 in Figure 5 may be moved from the position illustrated in which the straight edge 4 thereof is near the top one of the short sides 54 of the support 10 to a second position in which the ruler 2 extends substantially parallel to its original position but is nearer to the bottom short side 54 of the support 10.

The apparatus shown in Figure 5 is used substantially as described above with reference to Figures 1 to 4. The construction of the guide apparatus illustrated in Figures 5 to 7 is advantageous in that it facilitates use by both right-handed and left-handed persons. As shown in Figure 5, for example, the apparatus is set up for use by a right-handed person. For use by a left-handed person the ruler 2, cranked rod 60 and support 10 are disconnected, one end of the cranked rod is then inserted in a further bore 58 provided in the other transverse edge of the ruler 2, and the opposed end of the cranked rod 60 is then inserted in a further bore 56 provided in the opposite long side 52 of

-12-

the support 10.

Figure 7 shows a view of the underside of the support 10 of Figures 5 and 6. In this respect, and as shown, the underside of the support 10 is provided with a recess 62 in which the ruler 2 may be received. Furthermore, the Z-shaped rod 60 is clipped into a guide path therefore defined in the underside of the housing 10 and is held, for example, in position by appropriate ribs 64 formed on the underside of the housing.

10 The underside of the support 10 may be provided with rollers, skis or other means to facilitate movement of the support 10 over a page or other surface.

In the embodiments particularly described and illustrated herein, a substantially rectangular support 10 is provided on which a calculator is to be supported. However, it will be appreciated that a calculator is generally provided in a housing and it is possible for said support to provide the calculator housing. For example, the housing of a conventional calculator may be provided with bores, as 56, in one or more of the sides thereof. In this respect, a standard calculator provided with bores in its housing may then have a ruler 2 connected thereto by way of a cranked rod 60.

Often a calculator housing is provided with formations on its underside and clearly it would be possible to enable such recesses to hold the cranked rod and/or the ruler when not in use.

It will be appreciated that alterations and modifications may be made to the apparatus as particularly described and illustrated within the scope of this application.

-13-

CLAIMS

1. A guide apparatus for facilitating calculations, said guide apparatus comprising a rule having a straight edge,  
5 and a calculator apparatus connected to said rule, said calculator apparatus being connected to a part of said rule spaced from the straight edge thereof.
2. A guide apparatus as claimed in Claim 1, wherein the connection between the calculator apparatus and the rule is  
10 made by way of hinge means.
3. A guide apparatus as claimed in Claim 2, wherein said hinge means comprises a cranked rod having one end engaged with said rule and its opposed end engaged with said calculator apparatus.
- 15 4. A guide apparatus as claimed in Claim 3, wherein said cranked rod is substantially Z-shaped, and wherein said cranked rod is rotatable and/or pivotable about a longitudinal axis thereof whereby the rule and the calculator apparatus can be arranged in different planes.
- 20 5. A guide apparatus as claimed in Claim 3 or 4, wherein said one end of said cranked rod is connected to an edge of said rule generally transverse to said straight edge.
6. A guide apparatus as claimed in any of Claims 3 to 5, wherein said cranked rod releasably connects said rule and  
25 said calculator apparatus, said one end thereof being a push fit in a bore provided in said rule, and the opposed end being a push fit in a corresponding bore provided in said calculator apparatus.
7. A guide apparatus as claimed in any of Claims 2 to 6,  
30 wherein said hinge means comprises a double hinge and has two substantially parallel hinge axes which extend in different planes.
8. A guide apparatus as claimed in any preceding claim, wherein one or more recesses for receiving at least part of  
35 said rule when not in use are provided in said calculator apparatus.
9. A guide apparatus as claimed in any preceding claim, wherein said rule is a ruler made of any appropriate

-14-

material and having a substantially planar underneath support surface and at least one straight edge extending longitudinally thereof.

10. A guide apparatus as claimed in Claim 9, wherein said  
5 ruler is made of a transparent material and/or has a window therein.

11. A guide apparatus as claimed in any preceding claim,  
wherein said calculator apparatus comprises support  
apparatus for supporting a writing pad, calculator, or  
10 other equipment.

12. A guide apparatus as claimed in Claim 11, wherein said  
support apparatus comprises retention means for retaining  
equipment thereon.

13. A guide apparatus as claimed in Claim 11 or 12,  
15 wherein a base surface of said support apparatus carries  
wheels, rollers or bearings to facilitate movement of the  
guide apparatus over a work surface.

14. A guide apparatus as claimed in any of Claims 1 to 10,  
wherein said calculator apparatus comprises a calculator  
20 having a housing.

15. A guide apparatus as claimed in any of Claims 11 to  
14, wherein said ruler is connected to said support  
apparatus or to said calculator housing by way of a cranked  
rod, and wherein said support apparatus or said calculator  
25 housing is provided with at least one bore for receiving an  
end of said cranked rod.

16. Rule apparatus for releasable connection to a  
calculator, said rule apparatus comprising a ruler having a  
straight edge, the ruler being provided with a bore in an  
30 edge thereof which extends generally transverse to said  
straight edge, and a cranked rod having spaced ends, one of  
said ends of the cranked rod being releasably receivable  
within said bore in said transverse edge.

17. A guide apparatus substantially as hereinbefore  
35 described with reference to the accompanying drawings.

18. Rule apparatus substantially as hereinbefore described  
with reference to the accompanying drawings.



1/4

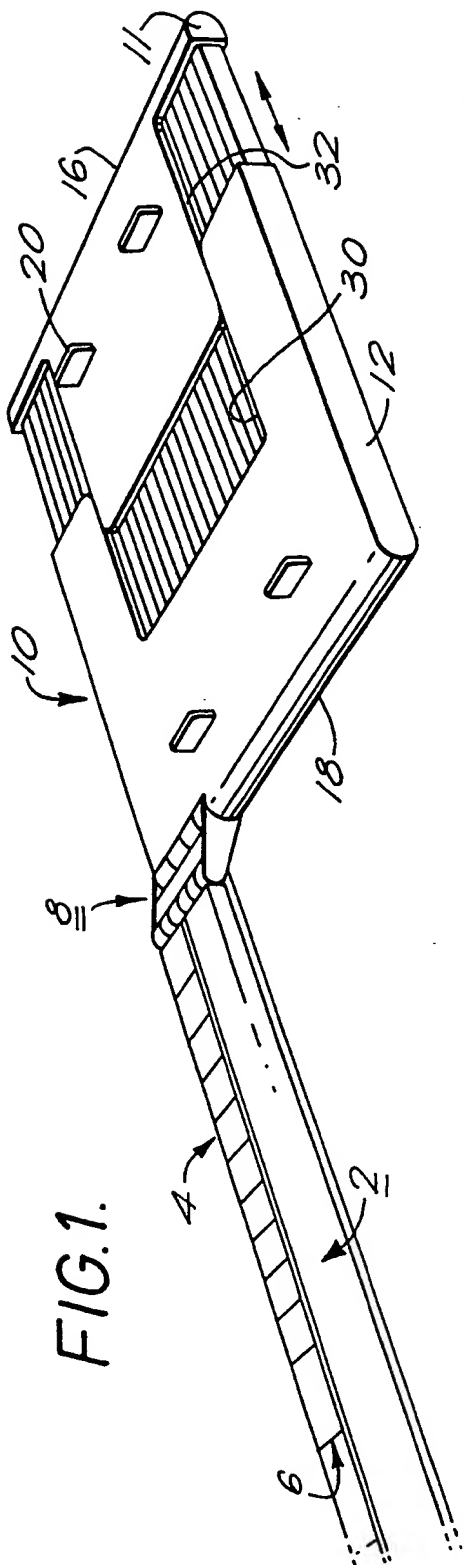


FIG. 1.

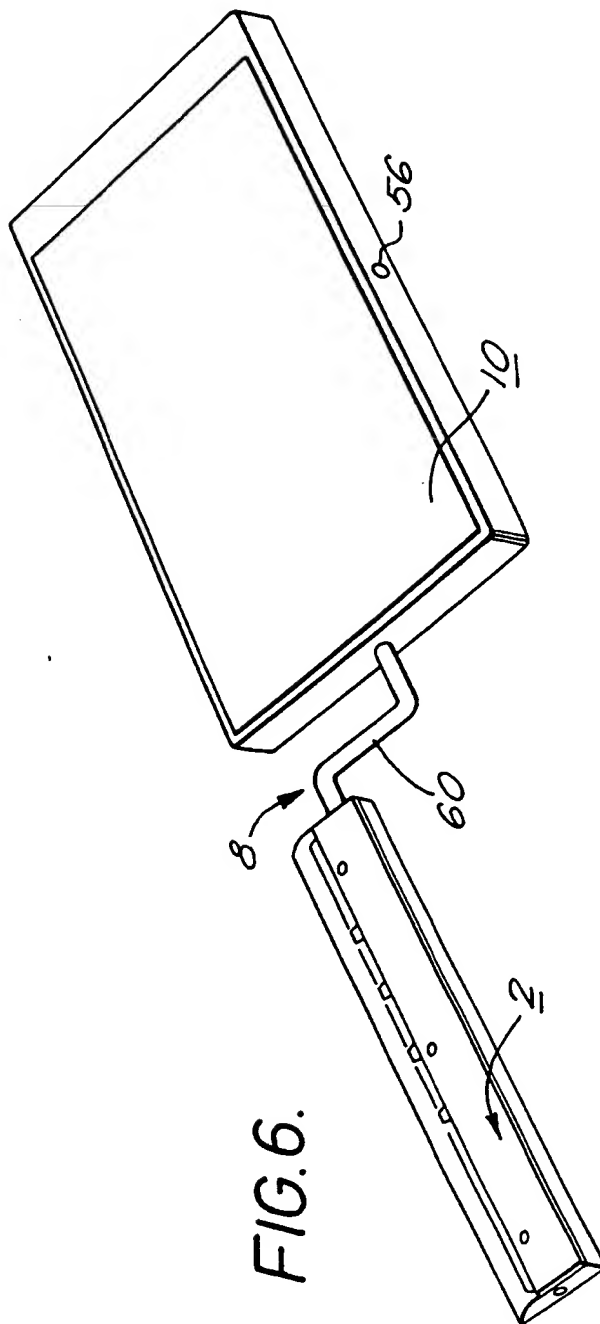


FIG. 6.

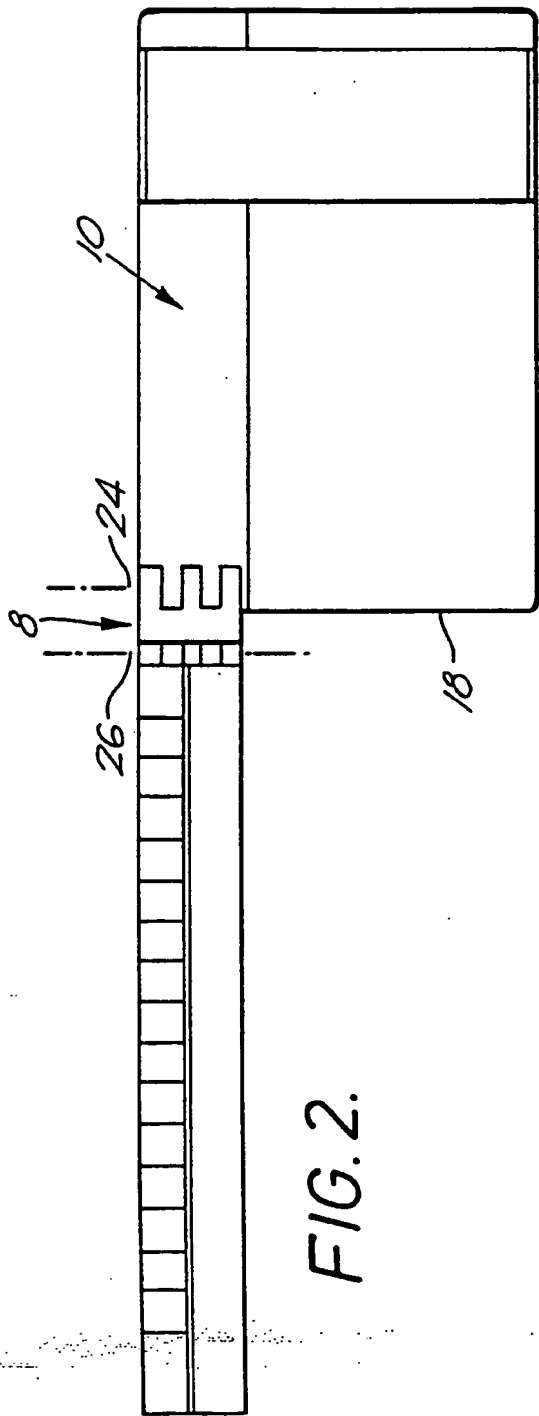


FIG. 2.

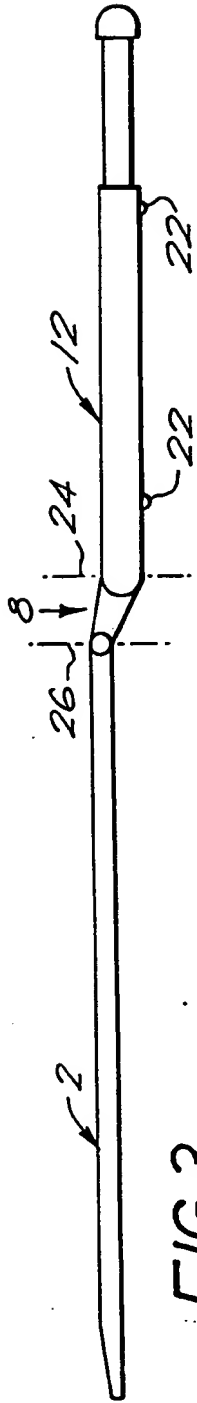


FIG. 3.

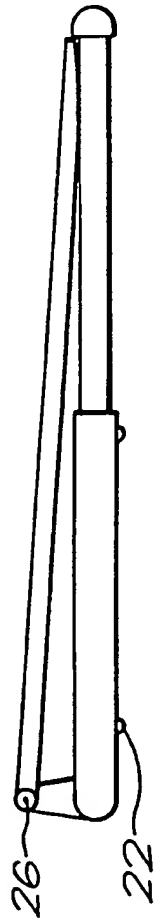
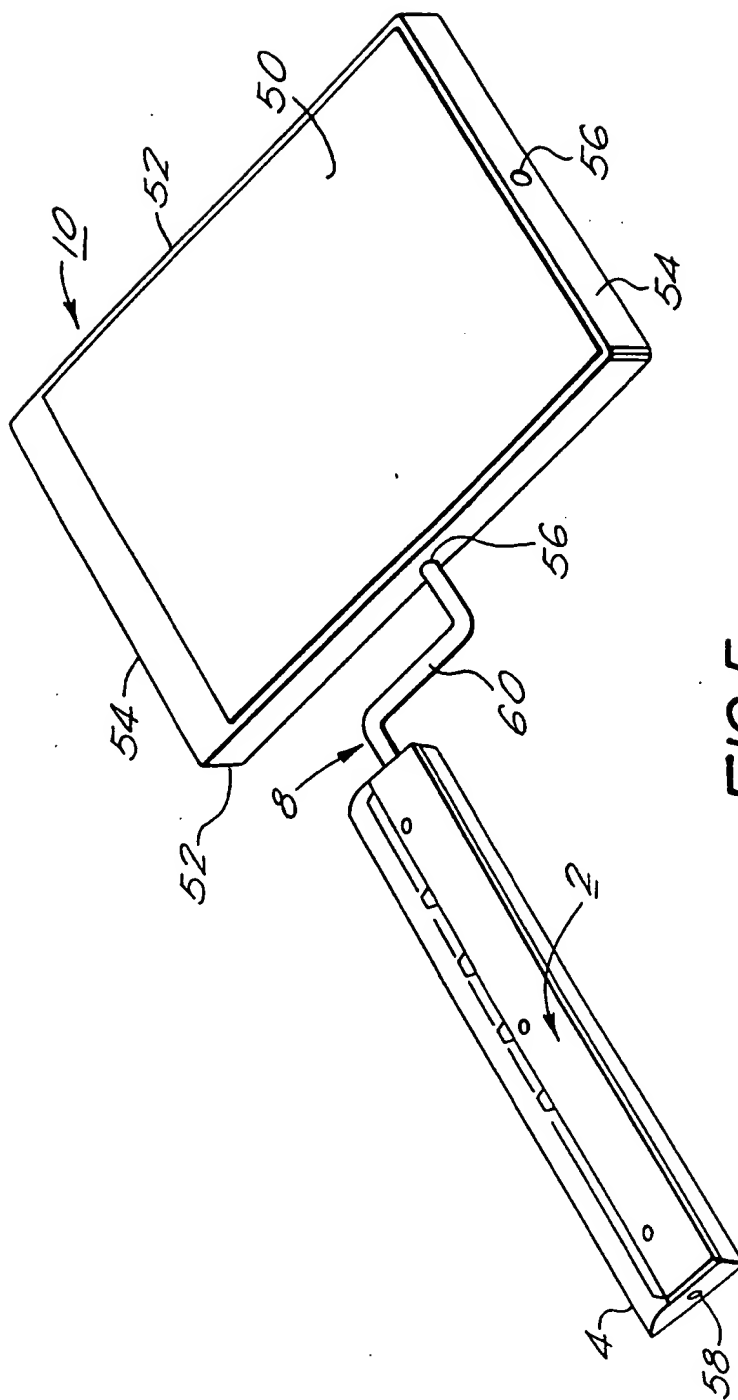


FIG. 4.

3/4



4/4

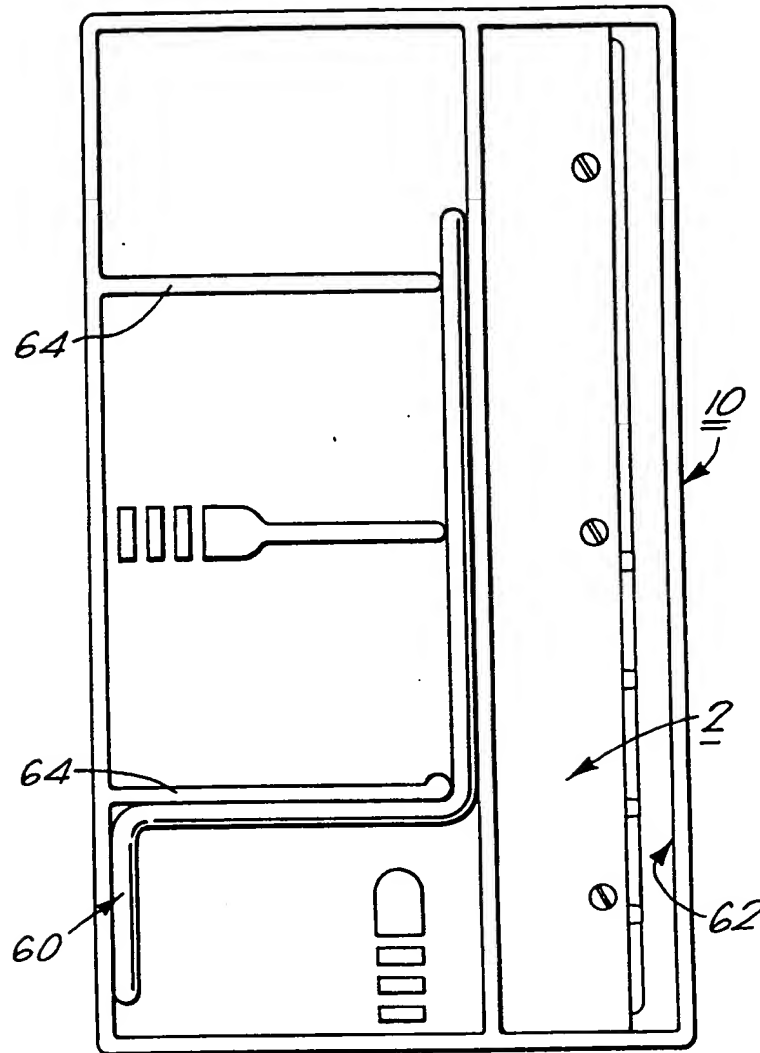


FIG. 7.

## INTERNATIONAL SEARCH REPORT

Intern. Application No

PCT/GB 93/02640

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 5 G06F15/02 B43L7/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 5 G06F B43L B43K G01B G09F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB,A,2 114 759 (GERBER SCIENTIFIC PRODUCTS) 24 August 1983 see page 1, line 126 - page 2, line 3; figures 1,5,6 ---	1,16-18
X	PATENT ABSTRACTS OF JAPAN vol. 10, no. 45 (P-430) 21 February 1986 & JP,A,60 190 801 (SHINKO DENKI KK) 28 September 1985 see abstract ---	1,17,18
A	US,A,3 918 635 (GILOMEN) 11 November 1975 see the whole document ---	1-18
A	WO,A,90 08938 (CHAZAL) 9 August 1990 see page 4, line 9 - page 5, line 2; figure 1 -----	1-18



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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